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A61J 11/02 // B65D 51/16

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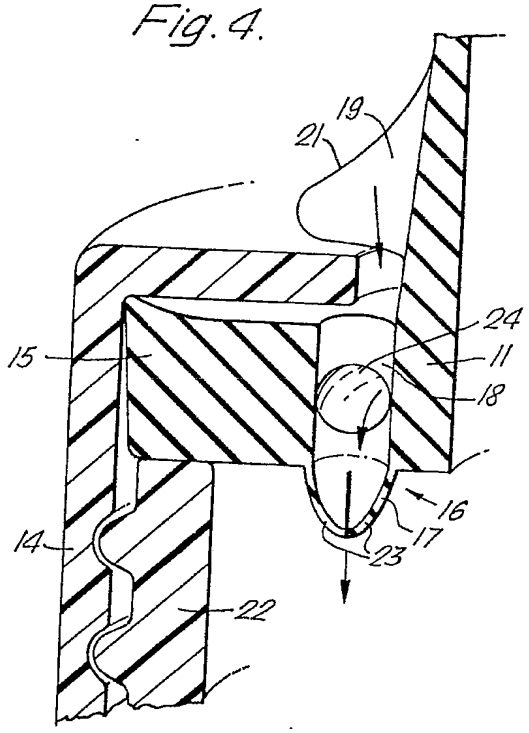
GB 1432798	GB 0794567
GB 1250518	US 3593870
GB 0921442	

(58) Field of search
B8T
Selected US specifications from IPC sub-classes B65D
A61J

(54) Teat

(57) A teat for a feeding bottle includes, in addition to the normal orifice, an extra orifice including a one way valve 16 through which air may pass into the feeding bottle so that the pressure within the bottle remains at substantially atmospheric pressure.

Fig. 4.



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The claims were filed later than the filing date within the period prescribed by Rule 25(1) of the Patents Rules 1982.
This print embodies corrections made under Section 117(1) of the Patents Act 1977.

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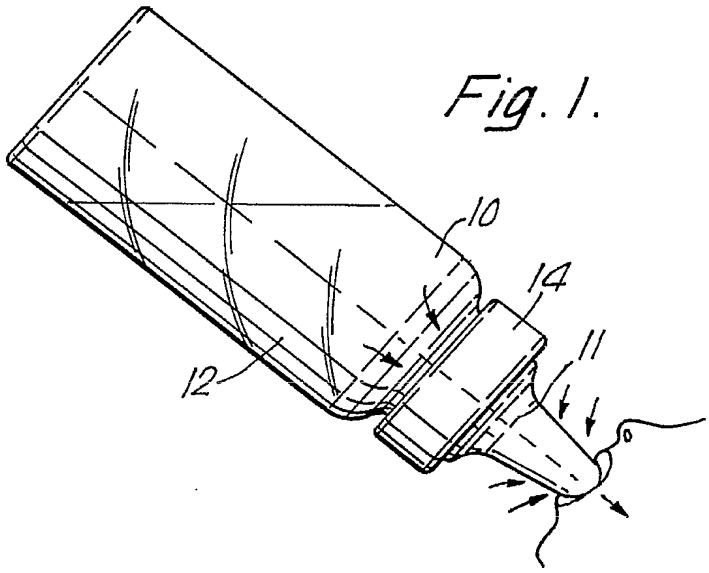

Fig. 1.

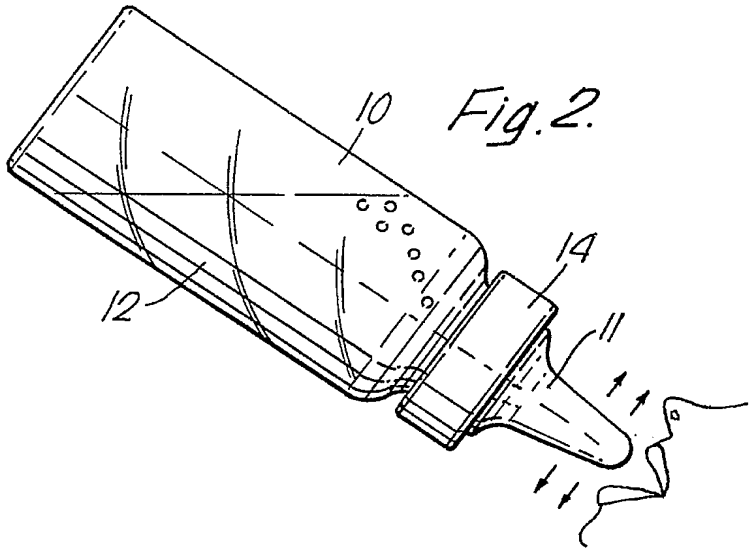

Fig. 2.

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Fig. 3.

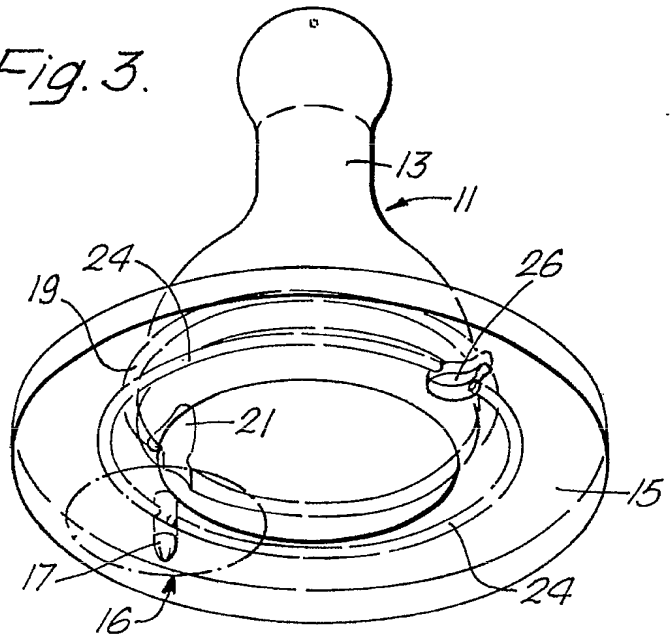

Fig. 5.

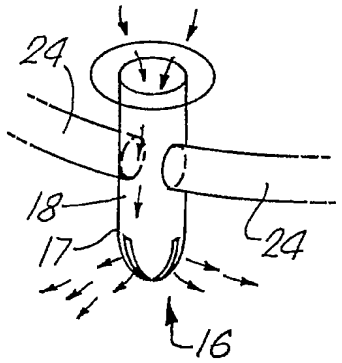

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Fig. 4.

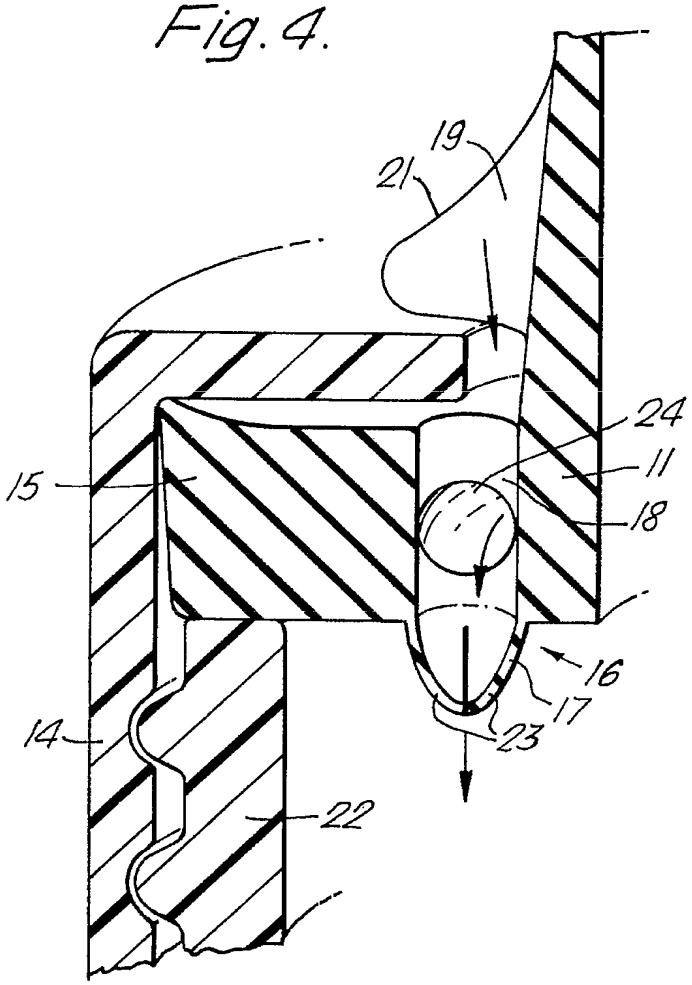

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Fig. 6.

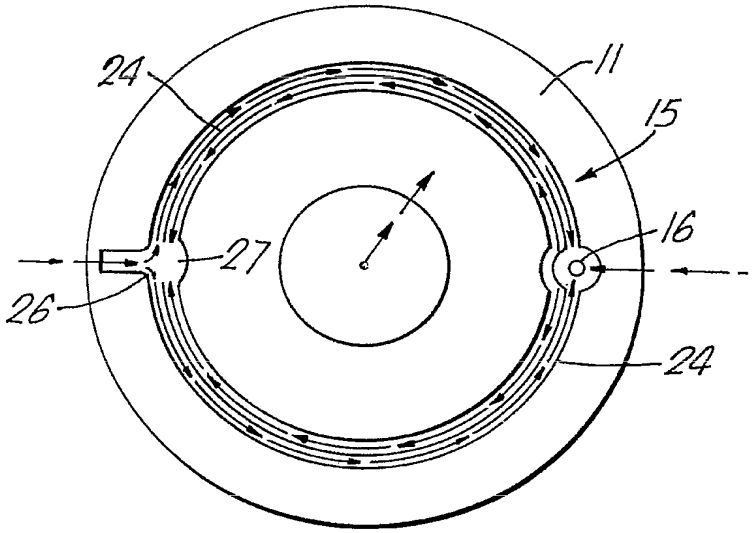


Fig. 7.

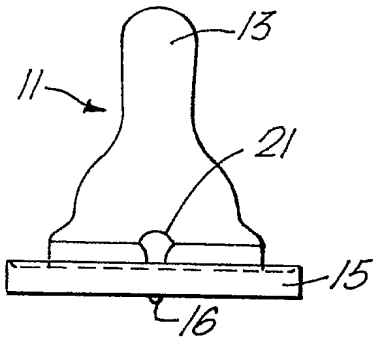
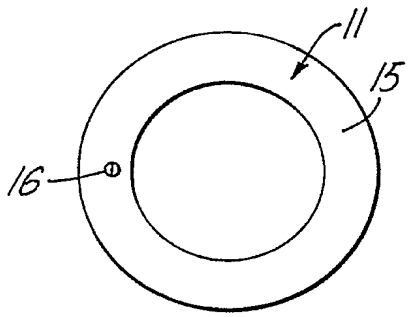


Fig. 8.



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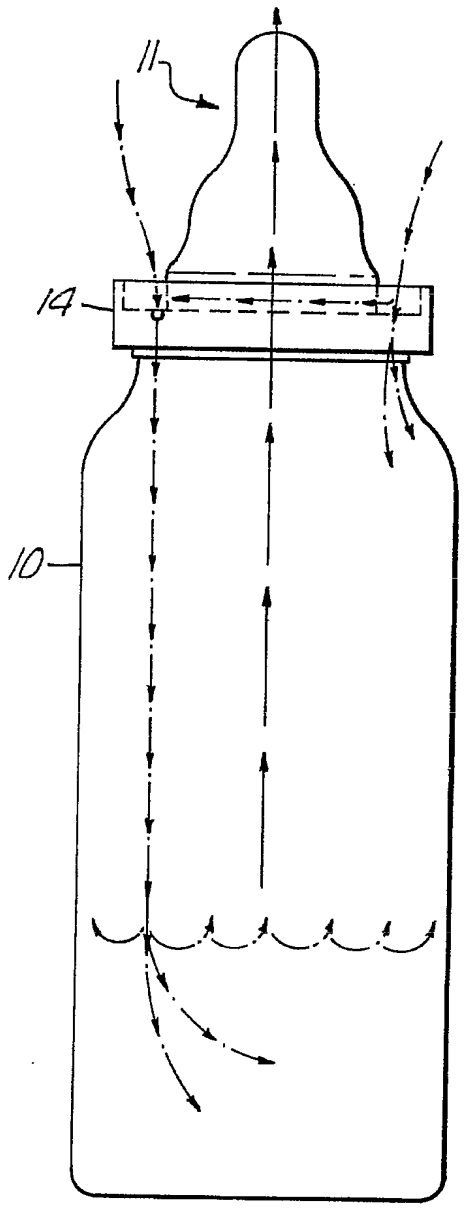

Fig. 9.

Fig. 10.

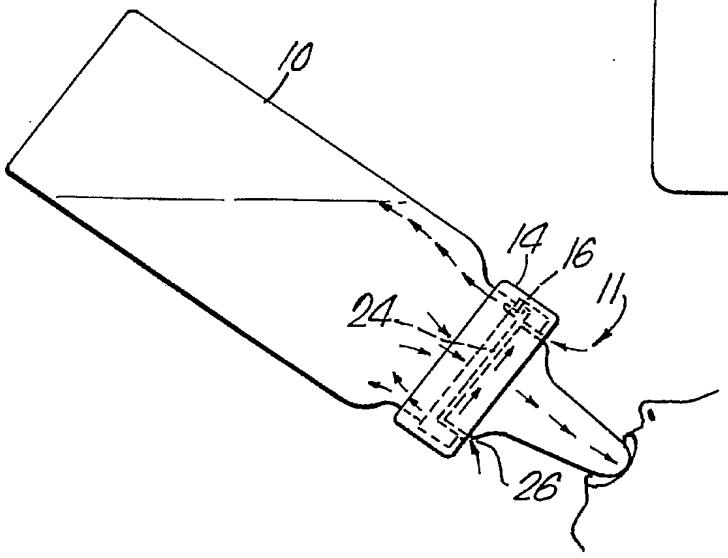

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Fig. 11.

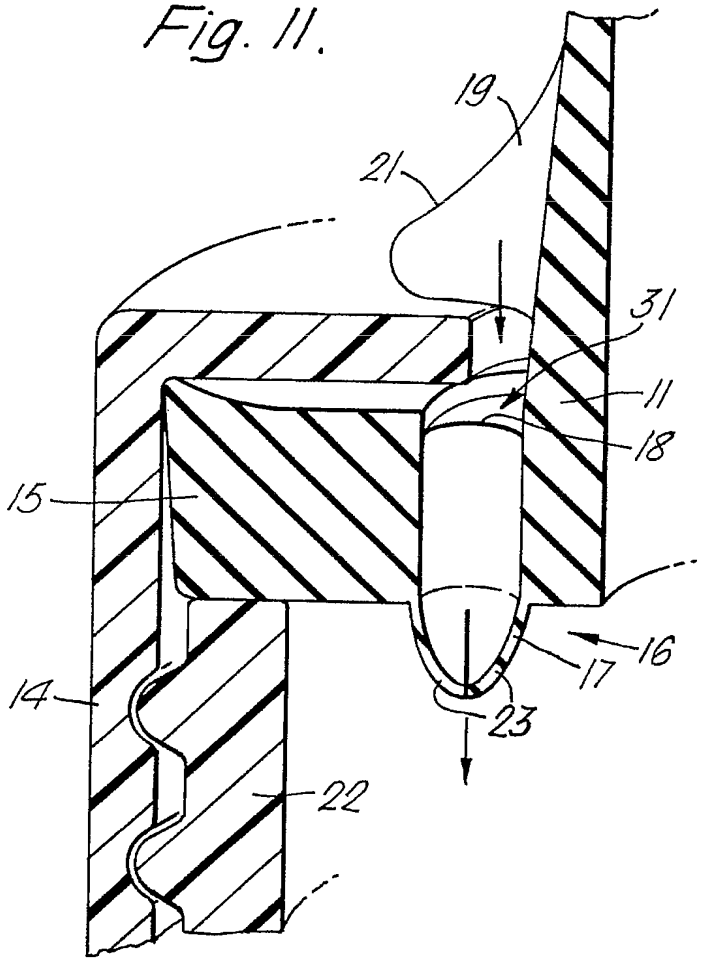

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Fig. 12.

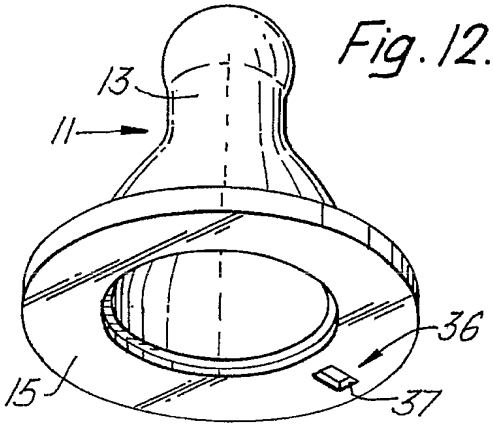
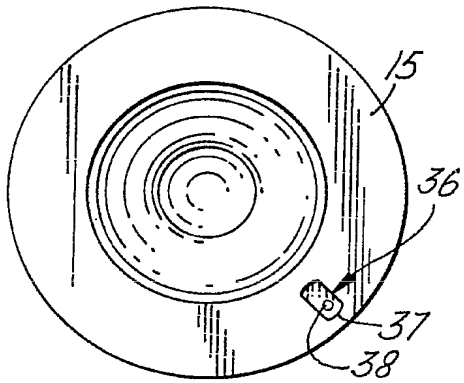


Fig. 13.



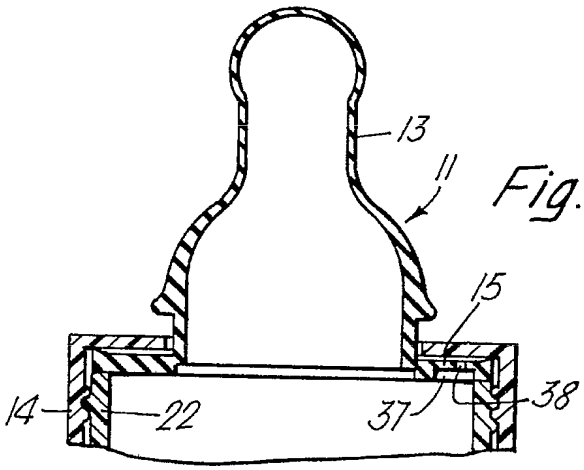


Fig. 14.

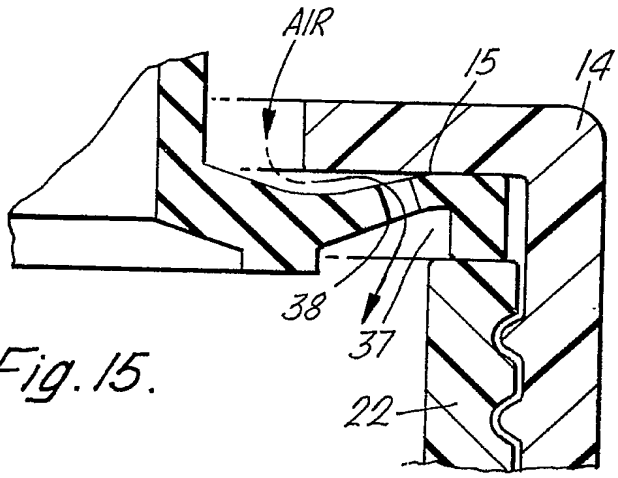


Fig. 15.

SPECIFICATION

Teat for use with baby's feeding bottle

The present invention relates to a teat for use with a baby's feeding bottle and a feeding bottle incorporating such a teat.

Feeding bottles with rubber or silicone rubber teats are well known. The teat is separable from the open top of the bottle, the bottle may be filled with milk and the teat may then be sealingly engaged with the top of the bottle. The teat is generally nipple shaped and incorporates a small orifice at its end through which the baby sucks milk from the interior of the bottle.

Problems which sometimes arise with conventional bottles and teats are that as liquid is withdrawn from the bottle by the sucking of the baby the volume of liquid withdrawn should be replaced by air if the pressure within the bottle is to remain at atmospheric pressure. Sometimes however the baby will suck milk from the bottle in such a way and to such an extent that air is not allowed back into the bottle through the hole in the teat and the pressure of the air within the bottle decreases below atmospheric pressure. In these circumstances it is more difficult for the baby to remove milk from the bottle as the reduction in pressure must first be overcome.

Furthermore, air can enter through the orifice in the nipple at a rapid rate and it is a common observation that towards the end of the feed the milk within the bottle contains a lot of large air bubbles caused by the air passing rapidly through the orifice in the end of the teat up through the milk and to the upper surface of the milk within the bottle. These aspects of use are illustrated in Figures 1 and 2 of the accompanying drawings in which Figure 1 shows a bottle 10 having a flexible rubber teat 11 attached to the bottle 10 by means of a cap 14 and the milk within the bottle being illustrated at 12.

Figure 2 shows air passing back into the bottle through the orifice in the end of the bottle.

The existence of air in the milk means that air passes into the baby's stomach causing flatulence as is well known to mothers.

Also the teat tends to collapse which makes further sucking by the baby difficult.

It has long been recognised that it is desirable to try to maintain the pressure of the air within the bottle substantially at atmospheric pressure and a past proposal uses a hole in the base of the bottle which is sealed by a rubber sealing ring and this rubber sealing ring allows air to go into the bottle when pressure within the bottle is below atmospheric. There are however difficulties with such an arrangement. The sealing ring must be fitted properly which can be a practical difficulty. Thus special instructions must be followed in how to fit and adjust the rubber sealing ring. The bottle will leak if the rubber sealing ring is not fitted properly and a special bottle is of course required. The rubber sealing ring is normally of a permeable material to allow air to pass through and in this case it will not undergo repeated sterilisation without deterioration.

The present invention provides a teat for a feeding bottle in which the teat incorporates, in addition to the normal orifice through which liquid may pass, an orifice which, incorporates by itself, or in combination with an adjacent member, a one way valve which will allow air to pass through the teat into the bottle but will not allow liquid to pass out of the bottle.

In one preferred arrangement the one way valve comprises a short tubular member forming part of the nipple of the teat and incorporates a resiliently closed member. The closed member may comprise a plurality of shaped portions which in their normal state seal with another but which under the effect of pressure from one side, will part so as to open.

In an alternative arrangement the one way valve comprises an orifice in a part of the nipple which cooperates with adjacent parts of the bottle or bottle cap so as to not pass liquid but under reduced pressure within the bottle causes the nipple to distort which thereby allows air to pass through the orifice.

Two arrangements of the invention will now be described by way of example only and with reference to Figures 3 to 15 of the accompanying drawings.

In the drawings *Figures 1* and *2* already referred to prior arrangements of bottle and teat,

Figure 3 is a perspective view from below of a first example of a teat according to the invention,

Figure 4 is a cross section through part of the teat of Figure 3,

Figure 5 is a schematic of part of the teat of Figure 3,

Figure 6 is a plan view of the teat of Figure 3,

Figure 7 is a side view of the teat of Figure 3,

Figure 8 is an underplan view of the teat of Figure 3,

Figure 9 is a side view of the teat of Figure 3 mounted to a feeding bottle,

Figure 10 is a diagrammatic side view of the bottle and teat of Figure 9,

Figure 11 corresponds to Figure 4 of an alternative arrangement of teat, comprising a second embodiment of the invention,

Figure 12 is a perspective view from below corresponding to Figure 3 of a teat comprising a third embodiment of the invention,

Figure 13 is an underplan view of the teat of Figure 12,

Figure 14 is a cross section of the teat of Figure 12 mounted to a bottle, and,

Figure 15 is a cross section corresponding to Figure 14 of the teat during use.

Referring to Figure 3 the teat 11 comprises an upstanding nipple portion 13 and an annular base portion 15. The teat 11 is made of a silicone rubber which may be boiled so as to sterilise it.

Figure 4 is a section through that part of the teat 11 which includes a non-return valve 16. The non-return valve is illustrated in Figure 5 also and as is clear from Figures 4 and 5 comprises a tubular

portion 17 which extends downwardly from the bottom surface of the annular base portion 15 and is positioned so as to extend into the interior of the bottle when the teat 11 is attached to the bottle. The tubular portion 17 is connected to a bore 18 which passes up through the thickness of the base portion 15 to the upper surface of the base portion 15 and thereby providing an open upper end through which air may pass. The lower part of the nipple portion 13 adjacent the base portion 15 includes an outwardly extending shoulder 19 but adjacent the bore 18 the shoulder 19 is cut away at 21.

The teat 11 is mounted to the threaded neck 22 of the bottle 10 by means of a threaded ring cap 14 the inner periphery of the ring cap 14 being seated below the shoulder 19 and the under surface of the ring cap 14 contacting the upper surface of the base portion 15 of the teat 11 so as to compress this base portion 15 into engagement with the upper periphery threaded neck 22.

Thus in use the lower end of the tubular portion 17 comprises a plurality of petal sections 23 which normally resiliently abut one another to close the lower end of the tubular portion 17 as is shown in Figure 5.

There is also provided in the teat 11 a bore 24 which passes within the thickness of the base portion 15 around the base portion 15 to a point 26 diametrically opposite the non-return valve 16. In practice the bore 24 may pass in both directions and meet at the point 26. At the point 26 there is provided a bore which extends upwardly from the bore 24 to the top surface of the base portion 15 thereby providing an open upper end and, the shoulder 19 adjacent this upwardly extending bore 27 is cut away at 28 similarly to the cut away 21.

Thus in use, as illustrated in Figure 10, as the baby sucks milk from the bottle, and the pressure within the bottle reduces below atmospheric, air may pass through the non-return valve 16 because the reduction in pressure will cause the petal sections 23 to part. Air may pass directly into the bore 18 and through to the non-return valve via the cut-away portion 21 or, if that is blocked, for example by the baby's mouth or for some other reason, air may pass through the cut-away 28 into the bore 27 around the bore 24 and thence through the non-return valve 16.

In normal use of prior teats, air is passed back into the bottle only through the hole in the end of the teat through which the baby is sucking and this only happens when the baby stops sucking so that the pressure within the bottle is reduced considerably and under those circumstances quite large bubbles pass rapidly up from the lower end of the teat into the bottle and form a froth on the top of the milk. With the present arrangement the diameter of the non-return valve 16 can be chosen so as to be small and the continuous operation of the non-return valve 16 is such that air passing into the bottle does so in the form of very fine bubbles which do not form a froth.

Although the non-return valve 16 will allow the passage of air into the bottle it will not allow the passage of milk out of the bottle.

Furthermore the construction of the non-return valve 16 may be such that very little reduction of pressure within the bottle is required to open the valve 16. In this way the flow of milk through the teat 11 may be easily maintained by the child.

Figure 11 shows an alternative arrangement to that of Figure 4. In this case in place of the bore 24 there is provided an open channel 31 in the upper surface of the base portion 15 which renders sterilisation of the teat 11 somewhat simpler but otherwise the operation is the same.

Figures 12 to 15 illustrate a third arrangement of teat. In this case the one-way valve 36 comprises an indent 37 in the lower surface of the base portion 15 which thereby effectively produces a thin portion of the base portion 15, and a bore 38 passes through the base portion 15 from the indent 37 to the upper surface. Figure 15 shows how when the pressure within the bottle is reduced, the base portion 15 at the indent 37 is flexed so as to become disengaged from the ring cap 14 and allow air to pass through the bore 38.

This third arrangement is more simple than the first and second embodiment but will generally require a greater reduction of pressure within the bottle before the one way valve 36 operates.

The invention is not restricted to the details of the foregoing examples.

CLAIMS

1. A teat for a feeding bottle which incorporates, in addition to the normal orifice through which liquid may pass, an orifice connected to a one way valve which allows air to pass through the teat into the bottle but does not allow liquid to pass out of the bottle.

2. A teat as claimed in claim 1 in which the one way valve comprises a short tubular member which incorporates a resiliently closed member.

3. A teat as claimed in claim 2 in which the closed member comprises a plurality of shaped portions which in their normal state seal with another but which under the effect of reduced pressure from within the bottle part so as to open.

4. A teat as claimed in claim 1 substantially as hereinbefore described with reference to the accompanying drawings.

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